

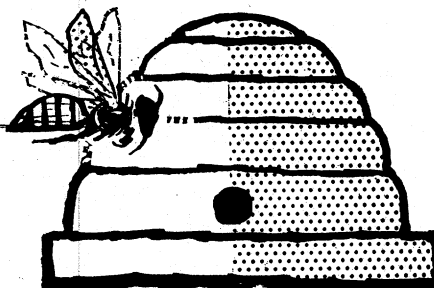
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by

Drs. Nathan Rubin,  
Alfonso R. Gennaro,  
Catherine N. Sideri,  
and Arthur Osol

# Honey

*in medicinal preparations*



**H**ONEY has long been used as a vehicle for medicinal preparations, but little information concerning its suitability for this purpose has been published. To obtain this information a 2-year research program\* was instituted at the Philadelphia College of Pharmacy and Science by the United States Department of Agriculture, under a contract supervised by the Eastern Utilization Research and Development Division of the Agricultural Research Service, and authorized by the Research and Marketing Act of 1946. The investigations were performed by Drs. Nathan Rubin, Alfonso R. Gennaro, Catherine N. Sideri, and Arthur Osol, of the College's School of Chemistry.

Twenty-one different types of medicinal preparations were studied to find out if honey may advantageously replace glycerin and/or syrup in the vehicles. In some instances honey imparted exceptional stability and taste; in others it was of little or no utility as a vehicle. A summary of the principal findings follows.\*

## Ferrous Sulfate Syrup

Honey proved to be an excellent vehicle for ferrous sulfate. A formulation containing the same proportions of ferrous sulfate and citric acid as in U.S.P. Ferrous Sulfate Syrup, in a vehicle of

approximately 1 volume of water and 4 volumes of honey, remained completely stable during the 11 months it was studied. The taste was unusually good, with practically no evidence of the astringency characteristic of many preparations containing iron.

## Sulfonamide Suspensions

For preparing suspensions of water-insoluble sulfonamides, of the type of U.S.P. Oral Trisulfapyrimidines Suspension, which contains sulfadiazine, sulfamerazine, and sulfamethazine, honey is an ideal vehicle component. Not only may chemically stable suspensions be prepared, but these have, in addition, the very desirable characteristics of slow settling, ease of uniform redispersion on moderate shaking, and unusual palatability.

## Preparations for Cough

The physical characteristics of honey make it an ideal vehicle for "cough syrups." In Europe, especially, honey is widely used for this purpose. Syrups containing either dihydrocodeinone bitartrate or codeine phosphate, an antihistamine (such as pyrilamine maleate), potassium guaiaacolsulfonate and sodium citrate, dissolved in a vehicle consisting largely of honey have excellent stability and taste, and good antitussive action.

## Other Preparations

Honey solutions of the more common water-soluble vitamins were also studied. Riboflavin, used in the form of

sodium riboflavin-5'-phosphate, proved to be the most stable of the vitamins, provided the solution is stored in an amber glass bottle. Thiamine is not as stable in honey as it is in some other vehicles, though in combination with riboflavin its stability is considerably improved. Ascorbic acid is less stable in honey than in simple syrup, and cyanocobalamin deteriorates very rapidly.

Suspensions of aspirin were very palatable but not very stable; in two days 5% hydrolysis occurred, and in five days this had increased to 12%. Nevertheless, honey dispersions of aspirin may be well suited for administration to infants and children if they are used within a day or two.

## Quality of Honey and Preservation

Honey suitable for use as a vehicle for medicinal products should be of the commercial variety designated as "heat-processed and filtered." Not all honeys described as having been filtered have acceptable clarity; use of such honeys involves a cumbersome filtration procedure, which may be avoided entirely if clear honey is used (but it should be noted that even the clearest honeys show the turbidity characteristic of colloidal solutions). To prevent microbial deterioration, 0.05% (w/v) of sorbic acid or potassium sorbate should be dissolved in honey-containing vehicles. The pH of preparations containing honey should never exceed 7; above this, honey darkens and acquires an unpleasant aroma. ■

\* A complete report of the findings of this investigation, including details of formulation, appears in the *American Journal of Pharmacy*, Volume 131, July, 1959.